

SN 10/616,610
Docket No. S-100,580
In Response to Office Action dated April 23, 2007

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REMARKS

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1. Claims 1, 5-9, 12-15, 17, and 18 are pending in the present patent application. Claims 1, 5-9, 12-15, 17, and 18 are finally rejected. Claims 1, 5 and 17 are amended. Claim 18 is cancelled.
2. Claims 1, 5, and 17 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. To support this rejection, the Office Action argues that in claim 1, the recitations "sending plasma support gas", "such that active reaction gas" and "a layer of plasma support gas" are indefinite because the gas is recited without any correlation to an identical recitation. These arguments are also applied in claim 5 and in claim 17.
3. Claims 1, 5, and 17 are amended. Amended claims 1 and 17 recite a supply of active reaction gas and a supply of plasma support gas as claim elements. Claims 1 and 17 also recite a first planar electrode and a second planar electrode parallel to the first electrode. Also according to amended claims 1 and 5, the plasma support gas tube, the active reaction gas tube, and the housing are configured such that as active reaction gas is sent through the active reaction gas tube and then through the discharge chamber, and as plasma support gas is sent through the plasma support gas tube and then through the discharge chamber, the plasma support gas surrounds the active reaction gas as both gases flow through the discharge chamber. According to amended claim 5, the first flowmeter meters the plasma support gas from the plasma support gas supply into the discharge chamber, and the second flowmeter meters plasma support gas from the active reaction gas supply into the discharge chamber. With these changes, claims 1, 5, and 17, as amended, are not indefinite. Therefore, Applicant respectfully requests the rejection of claims 1, 5, and 17 under 35 U.S.C. §112, second paragraph, be withdrawn.
4. Claims 1, 6, and 12-15 are rejected under 35 U.S.C. §102(e) as being anticipated by Dong et al. (US 7,079,370 B2) ("Dong '370"). To support the rejection of claims 1, 6, and 12-15 under 35 U.S.C. §102(e), the Office Action argues:

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(i) Dong '370 teaches an ion generator comprising Applicant's recited housing, discharge chamber, first electrode, second electrode, active reaction gas tube, and a plasma support gas tube at Fig. 7; in the paragraph crossing columns 13 and 14; in col. 9, lines 21-53; and in col. 12, lines 21-52;

(ii) Because the Dong '370 ion generator at Fig. 7 comprises the same configuration as that of Applicant's claimed apparatus shown in Fig. 3, and generates electrons from one of the first and second electrodes and the gas phase ionization, Dong '370 anticipates claims 1, 6, and 12-15.

5. Claim 1 is amended and now recites a first planar electrode and a second planar electrode spaced apart from and parallel to the first planar electrode. By contrast, Dong '370 does not teach a first planar electrode and a second planar electrode spaced apart from and parallel to the first planar electrode. Instead, Dong '370 teaches an electrode configuration of a tubular electrode 31 and coil electrode 32, neither of which are flat planar electrodes (see Dong '370, Fig. 6). Dong '370 also teaches an electrode having a tip (see Dong '370, Fig. 2a through 2i, and column 9, line 59 through column 10, line 13). Dong '370 uses these electrode configurations to produce a corona discharge. Tip-shaped electrodes, tubular electrodes, and coil electrodes are not flat planar electrodes. Because Dong '370 does not teach all of the claim limitations of claim 1, Dong '370 does not anticipate claim 1. Therefore, Applicant respectfully requests that the rejection of claim 1 under 35 U.S.C. 102(e) over Dong '370 be withdrawn.

6. Claims 6 and 12-15 depend from claim 1. Because Dong '370 fails to anticipate claim 1, Dong '370 similarly fails to anticipate the additional limitations of claim 6 and claims 12-15. Therefore, Applicant respectfully requests that the rejections of claims 6 and 12-15 under 35 U.S.C. §102(e) over Dong '370 be withdrawn.

7. Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Dong '370 in view of Banks et al. (US 5,693,241) ("Banks"). Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dong '370 in view of Okamoto et al., (US 6,224,837 B1) ("Okamoto"). For a proper rejection under 35 U.S.C. §103(a), the Office

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Action must first show that the prior art teaches all of the limitations of the claimed invention. Applicant traverses the rejections because the prior art does not teach all of the claimed limitations.

8. Claim 5 and claims 7-9 are dependent from claim 1, which includes a first planar electrode and a second planar electrode spaced apart from and parallel to the first planar electrode. Dong '370 fails to teach this electrode configuration. Banks is relied upon only for teaching a flowmeter. Furthermore, Banks also teaches electrode configurations similar to those of Dong '370, i.e. a tubular configuration and a configuration with needle tips, both of which produce a corona discharge. Thus, the references do not teach or suggest all of Applicant's claimed elements. Therefore, claim 5 is not obvious under 35 U.S.C. §103 (a) over Dong '370 in view of Banks, and claims 7-9 are not obvious over Dong '370 in view of Okamoto. Therefore, Applicant respectfully requests that the rejection of claims 5 and 7-9 under 35 U.S.C. §103(a) be withdrawn.

9. Claim 17 is rejected under 35 U.S.C. §102(e) as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over Dong '370 in light of Dong et al. (US 2004/0211675 A1) ("Dong '675"). In support of the rejection, the Office Action argues:

- (i) Dong '370 teaches an ion generator comprising Applicant's recited housing, discharge chamber, first electrode, second electrode, active reaction gas tube, and a plasma support gas tube at Fig. 7; in the paragraph crossing columns 13 and 14; in col. 9, lines 21-53; and in col. 12, lines 21-52;
- (ii) Dong '675 is relied on for disclosing in Fig. 9c the provision of two devices for generating electrons; and
- (iii) "if not, the provision of a plurality of the ion generators would be within the level of ordinary skill in the art for treating larger surface and/or increasing throughput".

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10. Applicant's amended claim 1 recites a first planar electrode and a second planar electrode parallel to the first planar electrode. Thus, Applicant's claimed apparatus includes planar flat electrodes. Neither Dong '370 nor Dong '675 teach or suggest a first planar electrode and a second planar electrode spaced apart from and parallel to the first planar electrode. Instead, Dong '370 teaches an ion generator, shown in Fig. 6, which includes tubular electrode 31 and coil electrode 32, neither of which is a flat planar electrode. Dong '370 also teaches an electrode having a tip, which also is not a flat planar electrode. Dong '675 teaches the electrode configurations of Dong '370. Thus, neither Dong '370 nor Dong '675 anticipate claim 17 under 35 U.S.C. 102(e). Furthermore, neither suggest to one of ordinary skill in the art an electrode configuration of a first planar electrode and a second planar electrode spaced apart from and parallel to the first planar electrode. Such an electrode would not produce the corona discharge taught by Dong '370 and Dong '675. Dong '675, Figure 5, shows an embodiment for removing oxides for the surface of a wafer. Although the details of the structure of the electrodes of Fig. 5 are omitted from the detailed description in paragraph [0058], the disclosed electrode configurations are clearly described in paragraph [0043], which are electrode configurations having a tipped electrode that can produce a corona discharge. Thus, Dong '370 in combination with Dong '675 does not render obvious claim 17. Therefore, Applicant respectfully requests that the rejection of claim 17 under 35 U.S.C. 102(e), and the rejection of claim 17 under 35 U.S.C. 103(a) over Dong '370 in view of Dong '675 be withdrawn.

11. Applicant respectfully requests that this amendment be entered into the present patent application. For the reasons set forth above, Applicant believes that all currently pending claims are in condition for allowance, and such action at an early date is

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earnestly solicited. No new matter has been added by the above changes.
Reexamination and reconsideration are respectfully requested.

Respectfully submitted,

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